## ***REMARKS***

Claims 21-30, 32-52, 79, and 82-87 are pending in the application. The Applicants note that due to a typographical error in the instant application, there was never a pending claim 31.

Claims 1-20 and 53-77 have been canceled without prejudice because they are drawn to non-elected inventions. The Applicants expressly reserve the right to prosecute the canceled claims in one or more divisional applications claiming the benefit of priority to the instant application and its predecessor(s). 35 USC § 121.

Claim 78, 80 and 81 have been cenceled without prejudice because they are redundant in light of claims 38-40 and 50-52, which consist of the same limitations as those of the canceled claims.

Claims 21-25, 27-30, 32-34, 41-46, 79, and 82-87 have been amended. Support for the amendments can be found throughout the application, including the claims as originally filed. Therefore, no new matter has been added. Importantly, the claim amendments should not be construed to be an acquiescence to any of the claim rejections. Rather, the amendments to the claims are being made solely to expedite the prosecution of the above-identified application. The Applicants expressly reserve the right to further prosecute the same or similar claims in subsequent patent applications claiming the benefit of priority to the instant application. 35 USC § 120.

## ***Election -- Restriction***

*Election of Invention*

Unfortunately, the Applicants cannot affirm the provisional election made on August 27, 2002. The Applicants sincerely apologize for this fact, but the business considerations underlying this decision have evolved since the provisional election was made.

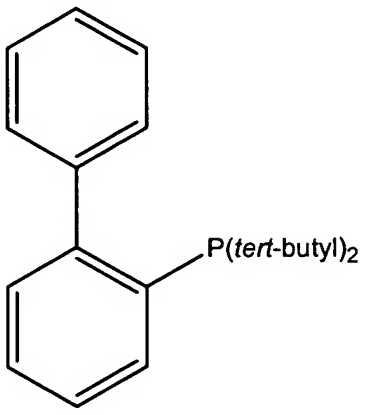
The Applicants respectfully wish to elect **Invention IX**, claims 41-52 and 78-87, drawn to methods represented by Scheme 2. However, the Applicants respectfully assert

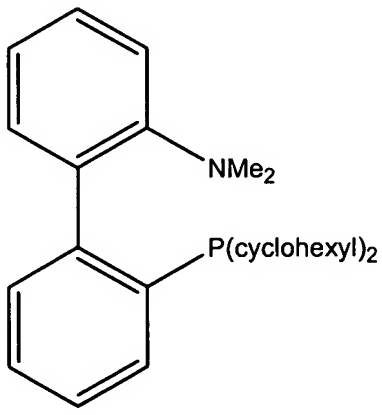
that simultaneous examination of Invention IX and Invention VIII (claims 21-40 and 78-87, drawn to methods represented by Scheme 1) would not place an undue burden on the Examiner because the Inventions are related as transition-metal-catalyzed carbon-carbon and carbon-nitrogen bond-forming methods. *See* MPEP § 803 ("If the search and examination of an entire application can be made without serious burden, the [E]xaminer must examine it on the merits, even though it includes claims to independent or distinct inventions."). Therefore, the Applicants respectfully request that the Examiner modify the instant Restriction Requirement, examining Inventions IX and VIII, i.e., claims 21-52 and 78-87, in the instant application.

To ease prosecution of the newly elected claims, the Applicants have canceled without prejudice claims 1-20 and 53-77.

*Election of Species*

With respect to the ligands used in the methods of Inventions IX and VIII, the Applicants respectfully elect the two species depicted below, 2-(di-*tert*-butylphophino)biphenyl and 2-(di-*tert*-butylphophino)-2'-(dimethylamino)biphenyl, respectively. The use of the species in the claimed methods is described and exemplified throughout the specification, e.g., in Examples 1-11, 19-21, and 26-49.




**REJECTIONS BASED ON 35 USC 112¶2**

Various claims stand rejected under 35 USC 112¶2, based on the Examiner's contention that they are indefinite for failing to particularly point out and distinctly claim

the subject matter that the Applicants regard as the invention. However, because the Applicants have not proceeded based on their provisional election, they cannot respond directly to the rejection made. Instead, the Applicants have amended the pending claims to render them definitie in the context of 35 USC 112¶2, e.g., by replacing forbidden open-ended langauge with permitted closed-ended language. The Applicants earnestly hope that the Examiner will deem the instant response to be fully responsive to the pending non-final office action.

Accordingly, withdrawal of the rejections under 35 U.S.C. § 112¶2 is respectfully requested.

**CLAIM REJECTIONS BASED ON THE JUDICIALLY-CREATED DOCTRINE OF OBVIOUSNESS-TYPE DOUBLE PATENTING**

Various pending claims stand rejected under the judicially-created doctrine of obviousness-type double patenting, based on the Examiner's contention that the claims are not patentably distinct from various claims in United States Patent 6,307,087; and various claims of United States Patent 6,395,916. However, because the Applicants have not proceeded based on their provisional election, they respectfully request that the Examiner hold the obviousness-type double patenting rejection in abeyance until the second Office Action in the instant application. Should the Examiner maintain the rejection, the Applicants expect that to expedite prosecution to allowance of the pending claims, the Applicants will submit two Terminal Disclaimers, corresponding to the patents cited by the Examiner.

## CONCLUSION

For the foregoing reasons, the Applicants respectfully request reconsideration and withdrawal of the pending rejections. Applicants believe that the pending claims are now in condition for allowance and early notification to this effect is earnestly solicited. If any questions are raised by this Response, the Examiner is urged to contact the undersigned at the telephone number listed below. A marked-up version of the amended claims appears below.

Respectfully submitted,
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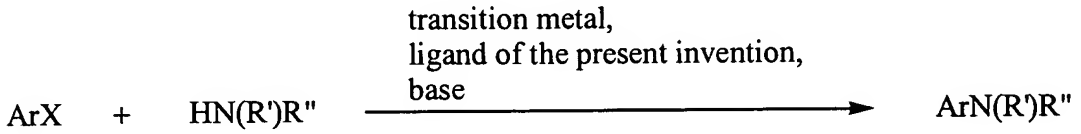
Date: 2/6/03

*Marked-up Version of Amended Claims Showing Changes Made*

21. **(amended)** The method depicted in Scheme 1:




**Scheme 1**

wherein

Ar is selected from the [set] group consisting of optionally substituted monocyclic and polycyclic aromatic and heteroaromatic moieties;

X is selected from the [set] group consisting of Cl, Br, I, $-OS(O)_2$alkyl, and $-OS(O)_2$aryl;

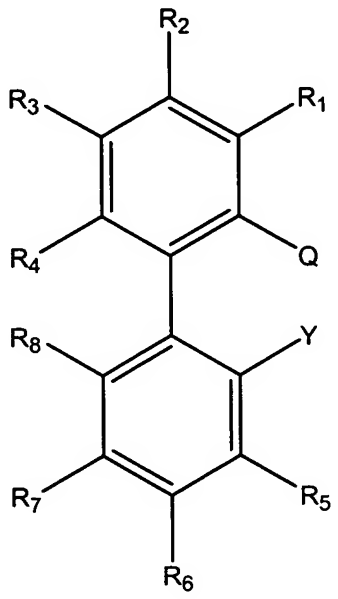
R' and R" are selected, independently for each occurrence, from the [set] group consisting of H, alkyl, heteroalkyl, aryl, heteroaryl, aralkyl, alkoxyl, amino, trialkylsilyl, and triarylsilyl;

R' and R", taken together, may form an optionally substituted ring consisting of 3-10 backbone atoms inclusive; said ring optionally comprising one or [more] two heteroatoms beyond the nitrogen to which R' and R" are bonded;

R' and/or R" may be covalently linked to Ar [such that the amination reaction is intramolecular];

the transition metal is selected from the [set] group consisting of the Group VIIIA metals;

the ligand is selected from the [set] group consisting of a compound represented by 2: [1-7 inclusive; and]




**2**

wherein

Q represent $P(R)_2$;

Y represents H, alkyl, $N(R)_2$, OR, or SR;

R, $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, and $R_8$, independently for each occurrence represent hydrogen, halogen, alkyl, alkenyl, alkynyl, hydroxyl, alkoxyl, silyloxy, amino, nitro, sulfhydryl, alkylthio, imino, carboxamido, phosphoryl, phosphonate, phosphine, carbonyl, carboxyl, silyl, thioalkyl, alkylsulfonyl, arylsulfonyl, selenoalkyl, formyl, acyl, aldehyde, ester, heteroalkyl, nitrile, guanidine, amidine, acetal, ketal, amine oxide, aryl, heteroaryl, azide, aziridine, carbamate, epoxide, hydroxamic acid, imide, oxime, sulfonamide, thioamide, thiocarbamate, urea, thiourea, or $-(CH_2)_m-R_{80}$;

$R_{80}$ represents independently for each occurrence an unsubstituted or substituted aryl, a cycloalkyl, a cycloalkenyl, a heterocycle, or a polycycle;

m is independently for each occurrence an integer in the range 0 to 8 inclusive; and

the ligand, when chiral, may be provided in the form of a mixture of enantiomers or as a single enantiomer; and

the base is selected from the [set] group consisting of hydrides, carbonates, phosphates, alkoxides, amides, carbanions, and silyl anions.

22. **(amended)** The method of claim 21, wherein:

[the ligand is **2**;]

the transition metal is palladium; and

the base is an alkoxide, amide, phosphate, or carbonate.

23. **(amended)** The method of claim 21 or 22, wherein:

[the ligand is **2**, wherein X] Y is hydrogen, and [Y] Q represents $P(alkyl)_2$; and

X represents Cl or Br.

24. **(amended)** The method of claim 21, wherein:

[the ligand is **4**;] Q represents $P(alkyl)_2$; Y represents H or $N(alkyl)_2$;

the transition metal is palladium; and

the base is an alkoxide, amide, phosphate, or carbonate.

25. **(amended)** The method of claim [22] 24, wherein:

[the ligand is **4**, wherein $R_1$ and $R_2$ are absent; $P(R)_2$ represents $PCy_2$, and $N(R)_2$ represents $NMe_2$; and]

X represents Cl or Br.

27. **(amended)** The method of claim 21, wherein: X represents Cl; [the ligand is **4**, wherein $R_1$ and $R_2$ are absent, $P(R)_2$] Q represents $P(t\text{-}Bu)_2$ or $PCy_2$; [and $N(R)_2$] Y represents H or $NMe_2$; the transition metal is palladium; and the base is an alkoxide, amide, phosphate, or carbonate.

28. **(amended)** The method of claim 21, wherein: X represents Br or I; [the ligand is **4**, wherein $R_1$ and $R_2$ are absent, $P(R)_2$] Q represents $P(t\text{-}Bu)_2$ or $PCy_2$; [and $N(R)_2$] Y represents H or $NMe_2$; the transition metal is palladium; the base is an alkoxide, amide, phosphate, or carbonate; and the transformation occurs at room temperature.

29. **(amended)** The method of claim 21, wherein: [the ligand is **5**;] $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, and $R_8$, independently for each occurrence represent hydrogen; the transition metal is palladium; and the base is an alkoxide, amide, phosphate, or carbonate.

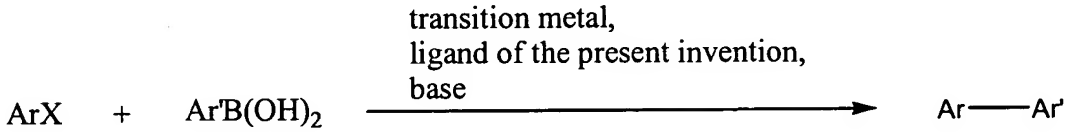
30. **(amended)** The method of claim 21, wherein: X represents Cl; [the ligand is **5**;] $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, and $R_8$, independently for each occurrence represent hydrogen; the transition metal is palladium; and the base is an alkoxide, amide, phosphate, or carbonate.

32. **(amended)** The method of claim 21, wherein: [the ligand is **2**, wherein X and Y both represent P;] the transition metal is palladium; and the base is an alkoxide [, amide,] or phosphate [, or carbonate].

33. **(amended)** The method of claim 21, wherein: X represents Cl; [the ligand is **2**, wherein X and Y both represent P,] $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, and $R_8$ [are absent,] represent hydrogen; [and all occurrences of R are cyclohexyl;] Q represents $P(t\text{-}Bu)_2$ or $PCy_2$; Y represents H or $NMe_2$; the transition metal is palladium; and the base is an alkoxide [, amide,] or phosphate [, or carbonate].

34. **(amended)** The method of claim 21, wherein [(alkenyl)X serves as a surrogate for ArX] $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, and $R_8$ represent hydrogen; Q represents $P(t\text{-}Bu)_2$ or $PCy_2$; Y represents H or $NMe_2$; the transition metal is palladium; and the base is sodium tert-butoxide or potassium phosphate.

41. **(amended)** The method depicted in Scheme 2:




**Scheme 2**

wherein

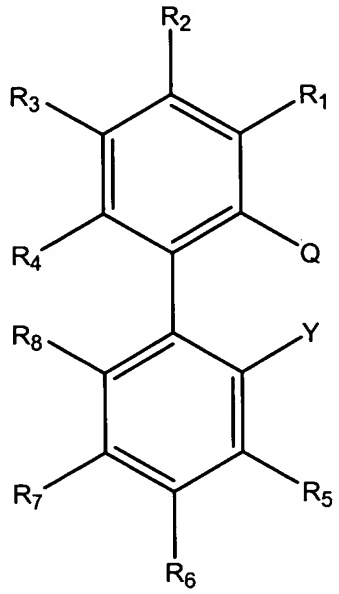
Ar and Ar' are independently selected from the [set] group consisting of optionally substituted monocyclic and polycyclic aromatic and heteroaromatic moieties;

X is selected from the [set] group consisting of Cl, Br, I, -$OS(O)_2$alkyl, and -$OS(O)_2$aryl;

Ar and Ar' may be covalently linked [such that the reaction is intramolecular];

the transition metal is selected from the [set] group consisting of the Group VIIIA metals;

the ligand is selected from the [set] group consisting of a compound represented by 2: [1-7 inclusive; and]




2

wherein

Q represent $P(R)_2$;

Y represents H, alkyl, $N(R)_2$, OR, or SR;

R, $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, and $R_8$, independently for each occurrence represent hydrogen, halogen, alkyl, alkenyl, alkynyl, hydroxyl, alkoxyl, silyloxy, amino, nitro, sulfhydryl, alkylthio, imino, carboxamido, phosphoryl, phosphonate, phosphine, carbonyl, carboxyl, silyl, thioalkyl, alkylsulfonyl, arylsulfonyl, selenoalkyl, formyl, acyl, aldehyde, ester, heteroalkyl, nitrile, guanidine, amidine, acetal, ketal, amine oxide, aryl,

heteroaryl, azide, aziridine, carbamate, epoxide, hydroxamic acid, imide, oxime, sulfonamide, thioamide, thiocarbamate, urea, thiourea, or $-(CH_2)_m-R_{80}$;

$R_{80}$ represents independently for each occurrence an unsubstituted or substituted aryl, a cycloalkyl, a cycloalkenyl, a heterocycle, or a polycycle;

m is independently for each occurrence an integer in the range 0 to 8 inclusive; and

the ligand, when chiral, may be provided in the form of a mixture of enantiomers or as a single enantiomer; and

the base is selected from the [set] group consisting of carbonates, phosphates, fluorides, alkoxides, amides, carbanions, and silyl anions.

42. (**amended**) The method of claim 41, wherein

[the ligand is **2**;]

the transition metal is palladium; and

the base is an alkoxide, amide, fluoride, phosphate, or carbonate.

43. (**amended**) The method of claim 41 or 42, wherein

[the ligand is **2**, wherein X] Y is hydrogen, and [Y] Q represents $P(alkyl)_2$; and

X represents Cl or Br.

44. (**amended**) The method of claim 41, wherein:

the transition metal is palladium;

[the ligand is **4**;] Q represents $P(alkyl)_2$; Y represents H or $N(alkyl)_2$; and

the base is an alkoxide, amide, carbonate, phosphate, or fluoride.

45. (**amended**) The method of claim [41] 44, wherein:

[the ligand is **4**, wherein $R_1$ and $R_2$ are absent; $P(R)_2$ represents $PCy_2$, and $N(R)_2$ represents $NMe_2$;]

X represents Cl or Br; and

the reaction occurs at room temperature.

46. **(amended)** The method of claim 41, wherein [(alkenyl)X serves as a surrogate for ArX, and/or (alkenyl)$B(OH)_2$ serves as a surrogate for $ArB(OH)_2$] $\underline{R_1, R_2, R_3, R_4, R_5, R_6, R_7, \text{ and } R_8}$ represent hydrogen; Q represents $\underline{P(t\text{-}Bu)_2 \text{ or } PCy_2}$; Y represents H or $\underline{NMe_2}$; the transition metal is palladium; and the base is cesium fluoride or potassium fluoride.

79. **(amended)** The method of claim 21[,] or 41, [53, or 65,] wherein [the transition metal and ligand are selected to provide the product when] X is chloride.

82. **(amended)** The method of claim 21[,] or 41, [53, or 65,] wherein [the transition metal and ligand are selected to consume] the limiting reagent is consumed in less than 48 hours.

83. **(amended)** The method of claim 21[,] or 41, [53, or 65,] wherein [the transition metal and ligand are selected to consume] the limiting reagent is consumed in less than 24 hours.

84. **(amended)** The method of claim 21[,] or 41, [53, or 65,] wherein [the transition metal and ligand are selected to consume] the limiting reagent is consumed in less than 12 hours.

85. **(amended)** The method of claim 21[,] or 41, [53, or 65,] wherein the [transition metal and ligand are selected to give the product in a] yield of the product is greater than 50% in less than 48 hours.

86. **(amended)** The method of claim 21[,] or 41, [53, or 65,] wherein the [transition metal and ligand are selected to give the product in a] yield of the product is greater than 50% in less than 24 hours.

87. **(amended)** The method of claim 21[,] or 41, [53, or 65,] wherein the [transition metal and ligand are selected to give the product in a] yield of the product is greater than 50% in less than 12 hours.